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ABSTRACT

The purpose of this study was to examine the quantity of words written by an intermediate elementary student when paper and pencil are used and compare it with the quantity of words written with a computer. One fifth-grade magnet homeroom consisting of 16 students was involved in this study. The participants were randomly placed into two groups. Before the experimental period began, the students were exposed to a keyboarding program called Mavis Beacon. The treatment group used eMates, while the control group used paper and pencil. During the daily journal writing time, which lasted 10 minutes for 20 days, one group wrote their journal with paper and pencil and the other group used their eMates. After five days of journal writing the groups switched. Both groups finished the study with 10 days of using their eMate and 10 days of using paper and pencil. Each day of the experiment, the journals were collected and word totals were counted. At the end of 20 days of journal writing the number of words written by each student was added. Each student had two totals, one word total for treatment and one word total for control. The student totals were averaged to arrive at the mean score for treatment and control. The control and treatment groups were compared using a t-test. The test revealed that there was not a significant difference. The researcher recommends that computers be made available to students that are involved in a writing activity. Using a word processor greatly increases interest in the activity. Due to the increase in interest, a student with a written expression deficit would benefit from this opportunity. Appendixes contain a list of journal topics and permission letters. Contains 18 references. (RS)

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ED 441 255

JOURNAL WRITING IN THE ELEMENTARY SCHOOL: WORD PROCESSOR VS. PAPER AND PENCIL

A Research Paper Presented to the

Department of Teacher Education

Johnson Bible College

In Partial Fulfillment

Of the Requirement for the Degree

Master of Arts in

Educational Technology and Bible

By

Ann L. Padgett

April, 2000

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APPROVAL PAGE

This research paper by Ann L. Padgett is accepted in its present form by the Department of Teacher Education at Johnson Bible College as satisfying the research paper requirements for the degree Master of Arts in Educational Technology and Bible.

Chairperson, Examining Committee

Member, Examining Committee

Member, Examining Committee

Member, Examining Committee

May 5, 2000

Date

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ABSTRACT

More and more funds are being spent by school systems on technology related equipment. In this study, a teacher with technology available wanted to provide information on the effects of it in her classroom, specifically in the area of writing. Students enjoy writing assignments when a computer is the tool. Does use of this preferred tool increase the number of words written by the student?

When considering the stages in the writing process, a computer naturally fits right into the process. Research has been found that supports this. Studies done with elementary through college level show that word quantity was higher when a computer was used. Quality also improved, although it was not the focus of these studies. The purpose of this study was to examine the quantity of words written by an intermediate elementary student when paper and pencil are used and compare it with quantity of words written with a computer.

One fifth grade magnet homeroom consisting of 16 students was involved in this study. The participants were randomly placed into two groups. Before the experimental period began the students were exposed to a keyboarding program called Mavis Beacon. The treatment group used eMates while the control group used paper and pencil. During the daily journal writing time, which lasted ten minutes for 20 days, one group wrote their journal with paper and pencil and the other group used their eMates. After five days of journal writing the groups switched. Both groups finished the study with ten days of using their eMate and ten days of using paper and pencil.

Each day of the experiment the journals were collected and word totals were

counted. At the end of the twenty days of journal writing the number of words written by each student were added. Each student had two totals, one word total for treatment and one word total for control. The student totals were averaged to arrive at the mean score for treatment and control. The control and treatment groups were compared using a t-test. The test revealed that there was not a significant difference.

The researcher recommends that computers be made available to students that are involved in a writing activity. Using a word processor greatly increases interest in the activity. The results of this study tell this researcher to make computers available for writing activities when possible. Due to the increase in interest, a student with a written expression deficit would benefit from this opportunity.

ACKNOWLEDGMENTS

Grateful acknowledgment is made for the financial support of my parents. Their encouragement has also been invaluable.

I also express my gratitude for the patience of my husband and daughter.

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Chapter 1

INTRODUCTION

Significance of the Problem

To use computers or not to, that is the question. This researcher has always been concerned with using the tools in the classroom in the most beneficial way. Thousands, if not millions, of dollars are being targeted in technology spending. Hence, as a recipient of that technology, this researcher must make wise decisions about the best use of that technology. Of even more importance is finding out how technology can assist in the education of children. Is it making a difference in academic areas? Is it making a difference in the education of a child? There are many questions about how computers should be integrated into a school's curriculum.

Statement of the Problem

All forms of writing help make written language meaningful to the individual child (Wadsworth, p 160). As an experienced teacher, getting students to write is difficult. It has appeared to this researcher that many students are just completing the assignment. Some motivation is needed to release a student from just writing what is required to asking for more time to finish. There have been some studies conducted to compare the writing quantity of computer generated writing with paper and pencil writing. Not many of these studies have focused on the elementary level. One conclusion of a study lead by Colette Daiute of Harvard University was that students said they enjoyed writing on computers more than writing with pen (Wresch, p. 138). If students enjoy writing with computers, is there a difference in the quantity of their writing? This is the question being addressed in this research project.

Definitions of Terms

eMate The name of the computer that will be used in this study is eMate. An eMate is a personal laptop computer that was designed by Apple Computer to be used in a school setting. These were purchased by the school system for use by fifth grade magnet students at an elementary technology magnet school. The eMate uses a pen-based interface. Using a supplied stylus, you can give commands to the eMate by writing, drawing, or tapping on the screen. Documents are automatically saved to the memory of the eMate. It can connect to a directly-connected Apple StyleWriter or a networked LaserWriter.

Journal Writing Journal writing is defined as a daily record, as of occurrences, experiences, or observations (Steiner, p10). The format is to be chosen by the student, unless the writing prompt asks for a specific format. These formats could include poetry, narrative, and report. The choices are not limited to these. This will be a daily activity, lasting ten minutes.

Word Processor The software in the eMate is called Newton Works version 1.0. The software has word processing, spreadsheet, drawing program and graphing calculator. Also included are a regular calculator, phone directory, appointment calendar, note pad, and various utilities.

Limitations of the Study

1. This study will be done in one fifth grade magnet homeroom.
2. The homeroom is made up of sixteen students.
3. The researcher is also the teacher.
4. The small sample size, as well as the procedure of gathering the sample, will

make it impossible to make generalizations about this study.

Assumptions

This researcher is making the assumption that keyboarding and handwriting speed will not have an effect on this study.

Hypothesis

The hypothesis for this study is that the quantity of words written by an intermediate elementary student will not improve significantly when computer generated writing and paper and pencil writing are compared at the .05 level of significance.

Chapter 2

LITERATURE REVIEW

Writing

What is the best environment in which to practice writing skills? Journal writing can be a means of self-discovery and self-knowledge (Steiner, p.2). What better way to interest someone in writing than personalizing it.

Most writers move through stages of prewriting, drafting, revising, editing, and publishing (Bright, p.9). With regard to these stages, it may appear that the use of word processors would have an advantage over the traditional pencil-and paper approach (Nichols, p 159).

Typing Tutorials

There have been studies completed that looked at the effects of typing skill on using a word processor for student writing. One study, done with fourth graders, had a control group that did not receive any instruction from a typing tutorial and the experimental group did receive instruction from a typing tutorial. The results of this study revealed no significant difference between the control and experimental groups in the length of their compositions, total number of revisions, types of revisions, or their attitudes about using the word processor for writing (Gerlach, p19). The study did reveal an improvement in speed and accuracy of the experimental group.

Mavis Beacon Teaches Typing was used in a study with elementary students that had behavior disorders. A minimum criteria was set for the students. All the students were able to exceed the minimum criteria (Langone, p. 145).

As far as the long term effects of typing tutorials, the patterns of research suggest

that the apparent promise of word processors is not being fulfilled even when keyboarding skills are emphasized (Beard, p. 184).

Word Processors

In a study lead by Lois Mayer Nichols with sixth-grade students, it appeared that the length of the composition, or the number of words, is affected by the method (computer or pencil-and-paper) (Nichols, p 165). The work completed with word processors was much longer than the work done with pencil-and-paper. Nichols also concluded that if keyboard skills were developed along with word processing knowledge that students' ideas would tend to flow more easily than when using paper and pencil (Nichols, p 164).

A longitudinal study was done by Owston and Wideman, of York University. They followed the students for three years, beginning in their third grade year. The group of students with the word processing treatment typically had more words in their texts (Owston, p 208).

A study with second graders looked at the effects of a word processor on their written composition. The results of the study indicated that the use of word processors with second grade elementary school pupils results in an overall improvement in the quality of their writing, and, at the same time, the stories written by these pupils tended to be longer (Jones, p 52).

In an analysis of word processing research, written by Robert L. Bangert-Drowns, five general propositions about word processing could be made.

1. In instructional contexts, students make more revisions when writing with word processing than they do when writing with paper and pencil.

2. Word processing students tend to write longer texts than students using paper and pencil.
3. Students produce neater and more error-free texts when writing with word processing.
4. Word processing alone does not improve the quality of students' writing.
5. Students generally have favorable attitudes toward word processing. (Bangart-Drowns, p 73)

Marilyn Cochran-Smith, in her review of literature that dealt with word processing and writing in elementary classrooms, mentioned several mediating factors that need to be considered when researching quantity of students writing. These factors that Cochran-Smith feels should be considered are very reasonable. This researcher will be considering them. She said that

> …although writing with word processing often produces slightly longer and more error-free texts, these findings need to be considered in light of the mediating factors of teachers' and students' keyboarding and systems familiarity, allocation of writing time, changing classroom organizations for learning, length of time of word processing implementation, and students' attitudes (Cochran-Smith, p 138).

Computer Experience

This researcher wanted to find something documented in a study concerning the question of computer experience. One study did include a quick look at the effect of computer experience on using a word processor. The subjects of this study were high school students. The researcher concluded that experience with computers did not greatly affect the writing and composing process (Peterson, p. 66). She did say that she suspects that experience with a specific software program may have a greater impact, although that hypothesis was not tested in her study (Peterson, p. 66).

At another level, in a study conducted with first-year college students to investigate the impact of computers on student writing, there appeared to be some evidence that a student's comfort level with computers affected how well the students did

in the writing course they were taking. Some of the students that had more exposure to computers actually had higher grades. Even with this revelation, this study concluded that the computer did not make a significant difference in the attitude or skill of the student (Blau, p. 156).

Time on Task

This researcher knows from experience how time can fly while working at a computer. Are computers capable of increasing the amount of time a student spends on a task? In a study conducted with elementary students that had been diagnosed with behavior disorders, it was observed that the students seemed to stay on task longer while working on the computer than with paper and pencil. The teacher of these students also noticed less behavior problems when the students were using the computer as compared to behavior while they were using paper and pencil (Langone, p. 155).

Word Processing Bias

This researcher is aware that preferences for word processing or paper and pencil vary. Student preferences and teacher preferences add an interesting variable to a study of writing and modality. In a study that was done at a Los Angeles area college, it was noticed that raters scored word processing papers higher than papers written by hand. As part of the study the papers that were word processed were converted to hand written and vice versa. The scores went down for those that had been originally in word processing format. Half of the raters did indicate a preference for hand-written papers . Interestingly, all students had a choice to use word processing or to write by hand. This study concludes that possibly the students that were already better writers chose to word process. (Robyler, p. 14).

A study with high school students was also conducted by another researcher. This study showed that the raters gave hand-written work a higher score than word processing work (Robyler, p. 15).

From these studies, reasons for a preference of handwritten essays over word processing have been identified. Raters seem to have higher expectations for typed essays. Raters can spot text errors more easily in typed text. Raters have more difficulty identifying the author's "voice" as an important part of the communication in typed text (Roblyer, p. 16).

Text Quality

In a review of research by Peacock and Beard, no difference was found in the writing quality of writers using pen and paper compared to those using word processors (Peacock, p. 288). They also noted that if some other factor were present, such as teacher input included with word processors, there was a significant difference. Another study, cited by Peacock and Beard, looked specifically at fifth graders and found that those writing by hand performed better than the students using a word processor (Peacock, p. 288).

Process Story Writing and Preferences

Elizabeth Keetley conducted a study with first graders to determine if a computer is more or less effective in teaching process story writing. The students in her study scored higher in a quality related score and wrote longer stories with more detail when using a computer (Keetley, p. 74). These first graders also gave feedback as to reasons for preferring computer access for writing versus paper-and-pencil:

1. Easier revisions

2. hands didn't get tired
3. monitor allows for easier re-reading
4. aesthetic quality
5.chance to use the computers
6.peer collaboration at the computers is an enjoyable educational experience
7.much quicker process (Keetley, pg. 75-76)

This study concluded that the computer is effective in teaching the process of writing to first graders. The quality and quantity of their writing was greater than with traditional paper-and-pencil (Keetley, pg. 77).

Negative effect of Writing with Computer

Computers are standard equipment in most classrooms today. How is this affecting writing tasks that use the traditional method of paper-and-pencil? In a study of writing test performance with middle schoolers, the students had become accustomed to writing with computers, which the teachers believed caused a decrease in writing scores when given a paper-and-pencil writing test (Russell, pg. 8). In an extended writing task, those students who did the assessment on the computer wrote almost twice as much and were more apt to organize their writing into more paragraphs (Russell, pg. 22). The phenomenon of computers in the classroom are creating another situation in the real world. For students accustomed to writing on computer, a student's writing ability based on hand written work may be an underestimate of their ability to write when a computer is available (Russell, pg. 24).

Chapter 3

METHODS AND PROCEDURES

Experimental Method

This study involved dividing the subjects into two random groups. One group received the treatment and the other group was the control group. After one week (five days) the groups switched. This study was conducted over four weeks, with each group receiving ten days of treatment and ten days of control. Therefore, each group was part of the control group and the treatment group. The journal writing took place in the morning for ten minutes each day of the experiment. A digital timer was used. Both control and treatment methods went on simultaneously in the classroom during the ten minute time limit. The subjects of the study were either writing their journal in paper and pencil or typing on their eMate. The topics chosen for the journal writing came from a teacher resource book that had been used by this researcher in the past. The list of topics is in the appendix section of this document.

Prior to the four week experimental period the subjects were exposed to a keyboarding program called Mavis Beacon. This was done for approximately four weeks before the word count began. The subjects were also accustomed to the routine of journal writing with a timer and switching between using the eMate and paper and pencil.

Selection of Subjects

The subjects involved in this study were fifth grade students ages 9-11 that had

been placed in a magnet classroom that focused on adding technology to the curriculum. Their parents had to go through an application process and submit that paper work to the Magnet Office of this researcher's school system. The students were also to have an interest in technology. The students in a magnet homeroom were randomly selected from those that had applied. All names were put into one of two groups, white or non-white. The number of white and non-white students was not evenly divided. There were ten non-white students and six white students.

The two groups were randomly selected by the researcher assigning each student a number. As the numbers were drawn, the students were placed in one of the two groups. Each group had a total of ten days to receive the treatment and the same number of days to be the control group.

The general population of the school is from low socioeconomic background to high. About 80% are on free lunch and the school is a Title I schoolwide school. The large differences in economic background are attributed to the school's position as a magnet elementary school designed to bring children from other school zones into the school.

Data Collection

Each day of the experiment the journals for that day were collected. The words were counted daily for the total written by word processor and the total written by paper and pencil. The daily totals were added together to get a total by eMate and paper and pencil for each student. They all had ten days of using paper and pencil and ten days to write with their eMate. At the end of the twenty days of journal writing, the students had

twenty journal entries.

Statistics

The totals of the word-processed entries and the paper and pencil entries were compared to see if the difference was statistically significant. This was done by performing a t-test on the mean scores.

Hardware and Software

The subjects of the study used an eMate for their word processing work. This hardware is no longer available from Apple Computer. The software used is called Newton Works version 1.0. It has similar functions to most word processing software.

The "hardware" for the control group is also important. The subjects used a pencil with a good eraser. The paper was provided to keep a consistency of materials used. They used lined wide-ruled notebook paper.

Chapter 4

RESULTS

eMate and Paper and Pencil Mean Scores

The journal entries were collected daily, and the daily totals were added to arrive at a total of words written by eMate and words written with paper and pencil for each student. The total of words written by students were calculated to arrive at the mean score for eMate (treatment group) and paper and pencil (control group). The mean of the control group was 709.06, while the mean of the treatment group was 796.13.

The control and treatment groups were compared with a t-test. There was not a significant difference in their scores. The hypothesis stated that the quantity of words written by an intermediate elementary student would not improve significantly when computer generated writing and paper and pencil writing are compared at the .05 level of significance. This hypothesis was accepted at the .05 level of significance.

TABLE 1

COMPARISON OF MEANS OF CONTROL AND TREATMENT GROUPS

Groups	N	Mean	Mean Difference	Std. Error of Means	t-ratio	Sig. 2-tailed
Control	16	709.06				
			-87.06	57.33	-1.519	.150
Treatment	16	796.13				

Chapter 5

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Summary

A group of sixteen fifth grade students in a self-contained regular education classroom took part in a study of word counts of their journal writing. They were divided into two random groups. One group used an eMate to write their journal entry, while the other group used paper and pencil. After one week (five days) of using one method the two groups switched methods. This was continued for a total of four weeks (twenty days). The words of each journal entry were counted daily. The daily totals were added together to get a total by eMate and paper and pencil for each student. A t-test was used to analyze the mean scores. The difference was not statistically significant.

Conclusions

Interest in journal writing increased when the students used their eMates. The control group always looked forward to switching to the eMate. At the beginning of the research some students appeared to prefer paper and pencil. These students were possibly less experienced with using a keyboard and had more frustration. It appeared to this researcher that toward the end of this research that even those students preferred using their eMate. Some students did not write for the entire time that was allotted. This varied from student to student. It appeared to the researcher that this may have been related to the topic chosen by this researcher for their journal entry. Even though it was not statistically significant, the students wrote more when using their eMates. It was

something they looked forward to.

Recommendations

The researcher recommends that computers be made available to students that are involved in a writing activity. Using a word processor greatly increases interest in the activity. The results of this study tell this researcher to make computers available for writing activities when possible. Due to the increase in interest, a student with a written expression deficit would benefit from this opportunity.

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APPENDICES

APPENDIX A

TOPICS USED FOR JOURNAL WRITING

1. If I were the President . . . .
2. If I were the teacher . . . .
3. It makes me tired when I have to . . . .
4. It makes me happiest when . . . .
5. If I ever get married . . . .
6. After school, I like to . . . .
7. My favorite sport is . . . .
8. I'm most afraid of . . . .
9. I never know what to do when . . . .
10. When I am bored, I . . . .
11. The kind of job I would like is . . . .
12. I almost never think about . . . .
13. I like to wear . . . .
14. I'd like to get a letter from . . . .
15. The last time I got in trouble . . . .
16. I need to learn how to . . . .
17. I'd like to throw away my . . . .
18. If I could buy a car, it would be . . . .
19. The best time of the day is . . . .
20. If I could, I'd invent a . . . .

KNOX COUNTY SCHOOLS
ANDREW JOHNSON BUILDING

Dr. Charles Q. Lindsey, Superintendent

November 12, 1999

Ms. Ann L. Padgett
5753 Acapulco Avenue
Knoxville, Tennessee 37921

Dear Ms Padgett:

You are granted permission to contact appropriate building-level administrators concerning the conduct of your proposed research study entitled, "Journal Writing in the Elementary School: Word Processors versus Paper and Pencil." In the Knox County schools final approval of any research study is contingent upon acceptance by the principal(s) at the site(s) where the study will be conducted.

In all research studies names of individuals, groups, or schools may not appear in the text of the study unless *specific* permission has been granted through this office. The principal researcher is required to furnish this office with one copy of the completed research document.

Good luck with your study. Do not hesitate to contact me if you need further assistance or clarification.

Yours truly,

Samuel E. Bratton, Jr.

Samuel E. Bratton, Jr., Ed.D.
Coordinator of Research and Evaluation
Phone: (423) 594-1740
Fax: (423) 594-1709

Project No. 020

P.O. Box 2188 • 912 South Gay Street • Knoxville, Tennessee 37901-2188 • Telephone (423) 594-1800

Dear Parents, September 7, 1999

I am pursuing a Masters Degree from Johnson Bible College in Educational Technology and Bible. Part of my degree requirement is a research project. I will be involved in the research project during the Fall of 1999. The project will involve the students participation during journal writing. There will be no mention of students by name or of Sarah Moore Greene Magnet Technology Academy or of Knox County Schools in my research document. For your child to be involved I must have your permission. Please sign below and indicate your option of involvement.

_____ (has) (does not have) my permission to participate in the journal writing research project conducted by Ann Padgett.

_____
Parent Signature